Space Weather Forecast

Issued on Thursday, 27 October 2022 at 01:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor geomagnetic storms throughout. Slight Chance of Minor (R1) Radio Blackouts throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity over the past 24 hours has been Low, with one common class flare from a relatively simple spot in the northeast quadrant. There are four other sunspot regions on the visible disc. Three of which are in the southwest quadrant, two of these are of modest size and complexity and one is small and simple. The remaining spot currently resides in the northeast which also displays modest size and complexity. A filament eruption (arc of plasma lifting off the disc) was observed lifting off the northeast limb, although unlikely to have any Earth-directed component, given its location. No Earth-directed coronal mass ejections have been observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind parameters continued to show a declining trend as Earth exits from a fast wind of a negative coronal hole. Solar wind speeds have been at background levels, peaking around 380km/s. Total magnetic field strength was weak, with the north-south component mostly weakly positive. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low with a chance (30%) of Moderate class flares.

Solar Wind / Geomagnetic Activity: No Earth-directed coronal mass ejections have been observed. The Earth is expected to experience continued slow ambient solar wind speeds during the first half of day 1 (27th). Either during the second half of day 1 (27th) or during day 2 (28th) the Earth is anticipated to connect with the high speed stream related to a coronal hole in the western hemisphere. A further enhancement is possible to elevated solar wind speeds on days 3 and 4 (29-30th) due to the arrival of another coronal hole currently near centre disk.

Geomagnetic activity should remain Quiet (Kp 0-2) with isolated Unsettled (Kp 3) intervals early on day 1 (27th). Any time from midday on day 1 until day 4 (27th-30th) there is an increasing chance of Active or Minor Storm G1 intervals (Kp 4-5), as the Earth connects with the high speed streams of two concurrent coronal holes.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	30	40	40
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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